



## ADMINISTRATIVE REPORT

**TO:** PARK AND RECREATION COMMISSION

**FROM:** Susanna Chan, Deputy Director of Public Works

**PREPARED BY:** Public Works Department

**MEETING DATE:** Wednesday, November 5, 2014

**SUBJECT:** INTEGRATED WASTEWATER MASTER PLAN AND BAY MEADOWS PARK  
WET WEATHER STORAGE

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### RECOMMENDATION

That the Parks and Recreation Commission:

- Receive information regarding the Integrated Master Plan for the City's sanitary sewer system; and
- Review and provide additional interests on the proposed location of a wet weather storage basin below the ball fields at Bay Meadows Park in order to provide essential wastewater services and meet regulatory requirements by preventing sewer system overflows.

### BACKGROUND

The City's sanitary sewer system includes wastewater collection and treatment. The collection system which includes 260 miles of pipes and 26 pump stations is owned and operated solely by the City. The Wastewater Treatment Plant (WWTP) is a regional facility that serves the residents of San Mateo, Foster City and portions of the neighboring communities of Hillsborough, Belmont, the Crystal Springs County Sanitation District (CSCSD) and certain unincorporated areas of the County. The City is the primary owner of and is responsible for the operation of the plant. Foster City has twenty-five percent (25%) ownership of the plant.

The operation of the sanitary sewer collection system and wastewater treatment plant is regulated by the Regional Water Quality Control Board (RWQCB). The City's collection system has a history of wet weather sanitary sewer overflows (SSOs) that result in the discharge of untreated or partially-treated wastewater. In March 2009, the RWQCB issued a Cease and Desist Order (CDO) jointly to the City of San Mateo, Town of Hillsborough, and CSCSD mandating elimination of SSOs in the collection system and requiring specific corrective actions. In response to the CDO, the City developed a Sewer System Management Plan (SSMP) which

focused on operation and maintenance of the facilities and a Capital Improvement Program (CIP) primarily focusing on the collection system.

In November 2011, the City initiated the development of a Wastewater Treatment Plant (WWTP) Master Plan to evaluate the facility needs for future growth, existing and future regulations, and replacement/repair of aging infrastructure. The Draft Wastewater Treatment Plant Master Plan was presented to the City Council on August 19, 2013 which identified projects and improvements needed to address current plant reliability issues, projected increases in wet weather flows reaching the plant, and increasingly restrictive regulatory requirements over the next 20 years.

The 2013 WWTP operation permit issued by the RWQCB requires coordinated capital improvement programs for the collections system and the treatment plant. The integrated capital improvement program will need to be submitted to the RWQCB in 2014. The City has been working to update and combine the collection system CIP and WWTP Master Plan to produce a comprehensive capital improvement program for the entire system to address flow projections through year 2035. Recycled water production and conversion of digester gas to compressed natural gas will be included as part of the integrated CIP. The current estimate for the total program cost when escalated over a 20 year period could reach near \$900 million.

There are several key factors that influenced the development of the Integrated Capital Improvement Program:

- The maximum capacity of the existing WWTP is constrained to 60 million gallon per day (MGD) which is the maximum outfall capacity of the plant.
- A computerized collection system model has been updated for future population projections and land use (Year 2035). Based on the updated model simulations, it is projected that wet weather flows significantly higher than the maximum capacity of the WWTP could reach the plant during storm events.
- Wet weather storage is necessary to prevent SSOs.
- The existing WWTP site is nearly built-out, with only a small footprint available for wet weather storage on the adjacent Detroit Drive site.
- The 2009 CDO requires that wet weather SSOs be eliminated.
- In-System Storage within the collection system helps buffer against future SSOs.

Based on the most recent collection system modeling effort and the City's desire to integrate the collection system and WWTP programs, two alternative approaches were developed as options to meet the requirements imposed by the Cease and Desist Order and address the other key drivers identified above:

- Full Conveyance: This option includes construction of all required improvements in both the sewer collection system (needed to convey all projected peak wet weather flows to the WWTP) and at the WWTP (to store and/or treat the flow).

- In-System Storage: This option consists of creation of In-System Storage, where a portion of the wet weather flows would be stored in the collection system, with the intent to reduce the downstream conveyance and WWTP treatment project sizing and costs.

#### *FULL CONVEYANCE OPTION*

Full conveyance of wet weather flows to the WWTP includes construction of larger pipe system throughout the City and increase of major pump station capacity to deliver the projected wet weather peak flows of 98 million gallons per day to the WWTP. This projected flow exceeds the capacity of both the treatment facilities and the outfall. A flow equalization process is required to mitigate changes in the flow rate system by providing storage to hold the wastewater when it is arriving too rapidly. An on-site WWTP flow equalization storage basin sized at 7.7 million gallons (MG) could reduce peak flows through the secondary treatment train to match the outfall capacity of 60 mgd. Significant additional treatment facilities are also required to handle this additional projected flow.

The equalization storage basin will be an underground concrete structure with some auxiliary appurtenances above ground. The details of the project have not been developed. The equalization storage basin could be located on the adjacent City owned Detroit Drive site. The Detroit Drive site is also planned for the City's new Corporation Yard for both the Public Works and Parks and Recreation Departments. In order to accommodate both the new Corporation Yard and the equalization storage basin on this site, a smaller footprint basin is anticipated. This means a deeper basin which could result in more expensive construction. Alternatively, the new Corporation Yard may have to be scaled down.

#### *IN-SYSTEM STORAGE OPTION*

This option consists of creation of upstream in-system storage, where a portion of the wet weather flows would be stored in the collection system, with the intent to reduce the downstream conveyance and WWTP treatment project sizing and costs. This option will not completely eliminate the need to construct an equalization storage basin near the plant, however, it would significantly reduce the size of the basin.

For in-system storage, viable storage sites needed to be identified for evaluation. The City has completed a thorough investigation and identified the Bay Meadows Park as a viable site for storage. The details of the investigation and evaluation are provided in Attachment 1.

The Bay Meadows Park site was the most favorable among the sites evaluated as it is strategically located upstream of locations where a high number of SSOs occurred during past storm events. By placing a 4.2 MG underground storage facility in Bay Meadows Park, the City could reduce the wet weather flows going to the WWTP from 98.0 mgd to 77.8 mgd; eliminate capacity upgrade requirements at Dale Avenue Pump Station; reduce the pipe size of the South Trunk Phase 2 project, and reduce storage at the WWTP to 4.0 MG.

Typically capacity improvements to the sewer system are constructed from upstream to downstream. Compared to the Full Conveyance option, the In-System Storage option provides quicker relief of SSOs for the downstream system, particularly at Delaware Street near the Event Center. This location has historically been problematic during storm events. Many SSOs occurred here which created significant issues to nearby facilities and developments.

The practice of “dual purposing” such a storage basin by locating it underneath other facilities is safe and is fairly common. The basin would primarily be used during peak wet weather events, meaning it would not be activated a majority of the time.

### **NEXT STEPS**

Public Works Department staff will be presenting the draft Integrated Wastewater Master Plan to the City Council on November 17<sup>th</sup>. The Master Plan will be submitted to RWCQB by December 2014 per permit requirement. While the draft Master Plan identifies the In-System Storage option as the recommended option due to the benefits it offers in providing earlier relief of SSOs, reducing costs, and minimizing in-street construction, its environmental impacts have not been fully evaluated so it has not been accepted as the preferred alternative under the California Environmental Quality Act (CEQA).

It is anticipated that the environmental review of the draft Integrated Wastewater Master Plan will be initiated in 2015. Conceptual design of both the Full Conveyance option and In-System Storage option will be developed to help better understand the environmental impacts of both options. Parks and Recreation Staff have identified some goals and interests as we move forward with planning, environmental review and design of this project, especially as it pertains to the option which includes the in-system storage basin at Bay Meadows Park:

- The project should not reduce any usable park land;
- The project should not reduce the flexibility of the master planning effort for the Bay Meadows Park;
- The project should provide benefits to sewer system as well as recreational benefits to the community

Public Works staff will work with Parks and Recreation staff to ensure these goals and interest are met through the process and will provide periodic updates to the Commission if needed.

### **BUDGET IMPACT**

Funding for the Wet Weather Storage Project will be from sewer user fees.

### **ENVIRONMENTAL DETERMINATION**

Since the Parks and Recreation Commission is only receiving information on the integrated sewer capital improvement program and the proposed wet weather storage project at this time, this meeting is not a project subject to CEQA in that there will be no impact on the environment. (CEQA Guidelines Section 15061(b)(3).)

Full environmental review for the Integrated Wastewater Master Plan, including the Wet Weather Storage Project, will be conducted by the City in 2015.

**NOTICE PROVIDED:**

All meeting notice requirements are met.

**ATTACHMENTS**

Attachment 1 – Storage Sites Evaluation Process

Attachment 2 – Storage Sites Investigated

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# Attachment 1

The evaluation process for identifying the potential in-system storage sites is described below:

## **Siting Criteria**

The criteria for determining potential in system storage locations included:

- Maximize benefits by locating storage in the lower (not at the top) part of the collection system.
- Consider locating storage upstream of bottlenecks or at historical overflow locations.
- Focus storage locations on areas where storage can reduce overall Capital Improvement Project (CIP) cost.
- Focus storage locations to West of Highway 101 away from areas with high groundwater table and tidal influence.
- Projects should limit highway and railroad crossings.
- Use only below ground storage to allow dual use of public spaces.
- Project locations should be limited to City-owned, school district-owned, or undeveloped properties to limit impacts to developed private property.
- Limit depth of storage basins to 8 feet of usable storage with 2 feet of freeboard, and 5 feet of cover to top of basin.

## **Potential Sites**

Using the siting criteria listed above, a review was conducted of City-owned property, local parks, schools, and undeveloped parcels to develop a list of possible storage sites. Attachment 1 shows the location of the potential in-system storage locations identified and indicates whether the site was evaluated further or if the site was eliminated from further study. The locations shown in purple, are upstream of major CIP projects, and have more potential to realize cost savings. Locations shown in red had been evaluated previously by the City and were eliminated from further study. Locations highlighted in orange were evaluated, but eliminated as they do not reduce overall CIP costs.

## **Preliminary Screening**

Using the potential sites identified, the updated hydraulic model was used to identify where in-system storage had the greatest potential to reduce SSOs and to eliminate planned wet weather sewer relief lines. Three potential storage locations provide the greatest flow relief to the system:

- A basin in the northern service area.
- A basin in the southern service area.
- A basin adjacent to a major interceptor with a history of SSOs in the area.

Four potential sites were selected from those shown in Attachment 2 that met the criteria listed above as well as: had sufficient area for siting a storage basin and was located in a northern or southern service area, or adjacent to a major interceptor with a history of SSOs. The four sites evaluated are listed in Table 1.

<b>Table 1 Potential Storage Sites for In-System Storage Integrated Wastewater Master Plan</b>				
<b>Location</b>	<b>CIP Projects Downstream of Storage</b>	<b># of Wet Weather SSOs Upstream Since 2004</b>	<b>Notes</b>	<b>Maximum Size of Storage Available</b>
Bay Meadows Park	Upstream of South Trunk Sewer Phase 2 and/or Bay Meadows	41	City owned park with ball and soccer fields	18 MG
Abbott Middle School	Upstream of South Trunk Sewer Phase 2 and another sewer relief project	5	Land owned by school district.  Alternative includes building storage under existing blacktop playground.	7 MG
Central Park	Upstream of El Cerrito Relief; South Trunk Sewer Phase 1 and two other sewer relief projects	10	City owned park with ball fields, tennis courts, large trees	10.5 MG total (2 locations)
San Mateo High School	Upstream of South Trunk Sewer Phase 1	3	Land owned by school district.  Alternative includes building storage under ball fields.	11.2

Of the four sites considered, the Bay Meadows Park site was the most favorable due to the high number of upstream SSOs caused by insufficient wet weather capacity in the downstream conveyance pipes. This location also had the potential to eliminate or reduce the need for a significant capital improvement project (South Trunk Sewer Phase 2).

The Central Park site has the smallest area of influence of the sites (smallest sewershed). In addition, the park has numerous trees, ball fields, and tennis courts that would be disrupted due to construction. Therefore, Central Park was eliminated from further consideration.

### **Modeling Results**

Following the preliminary screening exercise, the three remaining sites were modeled. Model simulations were run to determine the storage required at each location in order to reduce or eliminate SSOs downstream in the collection system. Under all scenarios, the model included all planned and needed CIP projects necessary to convey flows. The model results demonstrated that in-system storage at Abbott Middle School and San Mateo High School did not provide any significant benefits in terms of SSO elimination, trunk sewer surcharge reduction, or lower capital improvement costs. These two alternatives were eliminated from further analysis.